

Appendix 11

Annual Noise Categorisation Report

Bickerdike Allen Partners		Bickerdike Allen Partners	
LONDON CITY AIRPORT ANNUAL CATEGORISATION REPORT 2012 NOISE MONITORING		CONTENTS	Page No
Report to Mr Gary Hodgkiss Director of Operations Policy & Planning City Aviation House London City Airport The Royal Docks London E16 2PB A1125.57-001.13-PH/VGH 7 th June 2013		1.0 INTRODUCTION	3
		2.0 PLANNING REQUIREMENTS	3
		2.1 Noise Categories	4
		2.2 Number of Aircraft Movements.....	4
		3.0 NOISE MONITORING.....	5
		3.1 The Noise Monitoring System	5
		4.0 RESULTS.....	6
		4.1 Noise Levels.....	6
		5.0 CONCLUSIONS.....	8
		FIGURES	
		Figure 1 – Noise Categorisation Locations	
		Figure 2 – Noise Monitoring Locations – West of Runway	
		Figure 3 – Noise Monitoring Locations – East of Runway	
		APPENDICES	
		Appendix A – Mean Annual Departure Noise Levels	

1.0 INTRODUCTION

In accordance with London City Airport's planning obligations, aircraft operating at London City Airport are required to be categorised by their departure noise level into one of five noise categories. This aircraft categorisation process is set out in detail in Condition 7 of the planning permission dated 9th July 2009.

The categorisation procedure requires that, before any aircraft is permitted to operate at London City Airport, a provisional noise categorisation for that aircraft type must be approved in writing by the local planning authority. Annually, a review of the provisional categorisation is undertaken of each approved aircraft type having regard to the departure noise levels recorded using the airport's noise monitoring system. This report records the results of this review.

The airport's noise monitoring system records the departure events of aircraft over the categorisation year (January to December inclusive), the results of which are used to undertake the annual review of the provisional categorisation of aircraft.

This report records the results of a review of the provisional categorisation of those aircraft using the airport that received provisional categorisation over the period 1st January 2012 up to and including 31st December 2012. The review is based on the results obtained from noise monitoring in the period 1st January 2012 up to and including 31st December 2012.

In Appendix A, this report includes a list of those aircraft that have already received confirmation of their provisional categorisation to operate at London City Airport, together with their associated mean annual departure noise level (MSADNL) recorded over the period 1st January 2012 up to and including 31st December 2012.

Information is also provided on the number of aircraft movements and noise factored movements that have taken place at the airport over the period 1st January 2012 up to and including 31st December 2012.

2.0 PLANNING REQUIREMENTS

The planning requirements concerning the provisional categorisation of aircraft at London City Airport are set out in Condition 7(4) of the planning permission dated 9th July 2009.

It has been previously agreed that general aviation interim categorisation is simplified due to the small numbers of similar GA type aircraft. This was formally approved on the 19th November 1998 as planning application number P/98/0998, and places "General Aviation: Executive Turbo-Fan Aircraft" in Category A and "General Aviation: Non-Jet Aircraft" in Category B, according to the noise exposure categories (NECs) discussed in Section 2.1 below.

2.1

Noise Categories

Condition 7(2) to the planning permission of 9th July 2009 states that:

"Aircraft types using the airport shall be placed in categories and allocated noise factors as set out below:

Category	Noise Reference Level (PNdB)	Noise Factor
A	91.6 – 94.5	1.26
B	88.6 – 91.5	0.63
C	85.6 – 88.5	0.31
D	82.6 – 85.5	0.16
E	less than 82.6	0.08

"where the noise reference level is the departure noise level at the four noise categorisation locations shown on Plan P1 that accompanies this permission, expressed in PNdB..."

Figure 1 shows the noise categorisation points (NCPs) which are defined as being 2000 metres from the start-of-roll and 300 metres sideline from the extended centre line of the runway.

The noise reference level is determined using the mean annual departure noise levels (MADNLs) measured by the noise monitoring system. The noise factors are multiplying factors to the actual number of aircraft movements and are used to obtain the number of factored movements at the airport. The permitted numbers of actual and factored movements at the airport are detailed below.

2.2 Number of Aircraft Movements

Condition 8 of the planning permission of 9th July 2009 details the number of movements that are permitted at the airport:

"(1) The number of aircraft movements at the airport shall not exceed:

- (a) 100 per day on Saturdays and 200 per day on Sundays but not exceeding 280 on any consecutive Saturday and Sunday
- (b) 592 per day on weekdays except 1 January, Good Friday, Easter Monday, the May Day holiday, the late May bank holiday, the late August bank holiday, 25 December and 26 December
- (c) 132 on 1 January
- (d) 164 on Good Friday
- (e) 198 on Easter Monday
- (f) 248 on the May Day Holiday
- (g) 230 on the late May Bank Holiday

- (h) 230 on the late August Bank Holiday
 - (i) 100 on 26 December
 - (j) 120,000 per calendar year
- (2) In the event of there being a Bank Holiday or Public Holiday in England which falls upon or is proclaimed or declared upon a date or dates not referred to in sub-paragraph (c) to (j) (inclusive) of condition 8(1) then the number of aircraft movements permissible on that date shall not exceed 330 unless the local planning authority otherwise agrees in writing but in any event the limit for any particular date or dates shall not exceed 396 per day.”

In addition, condition 8(4) adds a requirement concerning the number of factored movements as stated below:

“(4) The number of factored movements shall not exceed:

- (a) In any one week the number of permitted aircraft movements for that week by more than 25%
- (b) 120,000 per calendar year.”

Condition 8(5) defines a factored movement as stated below:

“(5) For the purpose of condition 8(4) the number of factored movements shall be calculated by multiplying the number of take-offs and landings by each aircraft by the relevant noise factor for an aircraft of this type under condition 7 and adding together the total for each aircraft type using the airport.”

3.0 NOISE MONITORING

3.1 The Noise Monitoring System

A precision Brüel & Kjær noise monitoring system was first installed in March 1992 consisting of four permanent noise monitoring terminals arranged in two gateway pairs. The four noise monitoring terminals (NMTs) were located as close as possible to the four noise categorisation points (NCPs), taking account of local site constraints. Correction factors were developed to account for any difference in position between the NMT and NCP. This system was upgraded by Brüel and Kjær in 2000 and a flight track monitoring system added.

The NMTs send data to a central computer each day for long-term storage and analysis. The analysis determines which noise events should be correlated with aircraft movements by referring to radar data (previously the flight information display system, FIDS, prior to 2000). The system records the aircraft movements for each day.

The categorisation procedure is based around the measurement of noise from departing aircraft at the four points noise categorisation points, two at each end of the runway. As an aircraft flies through a gateway pair of noise monitors, the departure noise level is measured in dB(A) at each noise monitoring terminal. Corrections are applied to the measured noise

level to take account of where a noise monitor is not located exactly at the noise categorisation point and also for converting from the noise units of dB(A) into PNdB¹. Finally, the mean departure noise level is determined from the average of the resulting gateway pair corrected noise measurements.

This noise control regime described above has been in operation for approximately 20 years. During this time, a large amount of data has been obtained concerning the departure noise characteristics of aircraft in operation at the airport. As a result, it has been possible to categorise each aircraft type operating at the airport.

For the existing noise monitoring system to operate efficiently, it is necessary to maintain the four noise monitors in operation and, as far as possible, to ensure that the landscape around each monitor is relatively clear of any large objects (such as buildings). Significant development has taken place around the airport over the years, particularly in close proximity to some of the noise monitoring terminals. This led to the need to relocate some of the noise monitors from their original positions (e.g. NMT 1 and NMT 3) to ensure more accurate noise monitoring. The current locations of the four noise monitoring terminals are shown in Figures 2 and 3.

New correction factors have been determined from a study² to account for the above changes, based on a combination of acoustic modelling and consideration of historical noise data. In determining these new factors, a greater weight was given to historical data which was based on significant samples of aircraft departure noise measurements taken before and after changes at or around the relevant NMTs. The acoustic modelling provided a useful means of validating the findings to a first approximation.

During the calendar year of 2012, the noise and flight track monitoring system has been in operation every day, enabling the measurement of data to achieve a correlation of 97% of all aircraft departures from the airport during this period.

4.0 RESULTS

4.1 Noise Levels

As discussed in Section 3.1 of this report, the following correction factors are applied to account for the NMT to NCP relationship and any associated reflection effects, see below:

¹ dB(A) is the unit of the A-weighted Sound Level. PNdB is the unit of the Perceived Noise Level. The latter is considered to better represent the subjective noise of an aircraft noise event by taking into account the presence of any discrete tones.

² NMT Correction Factor Assessment Report, Bickerdike Allen Partners, Report A1125-111-R01-PH, 9th July 2008.

NMT NMT – NCP and reflection effect correction factors

- 1 (NW) -6.1
- 2 (SW) -4.6
- 3 (NE) -6.4
- 4 (SE) -1.7

There have been no new aircraft types seeking provisional categorisation at London City Airport during the period 1st January 2012 up to and including 31st December 2012. No categorisation changes to existing aircraft types at the airport are sought either.

A full list of aircraft types and their associated mean annual departure noise level recorded over the period 1st January 2012 up to and including 31st December 2012 is included at Appendix A.

4.2 Number of Actual and Factored Aircraft Movements

Table 4.1 shows the number of actual and factored aircraft movements in the period 1st January 2012 to 31st December 2012 inclusive.

Table 4.1: Aircraft Movement Numbers			
Aircraft Type	Number of Aircraft Movements	Noise Factor	Number of Factored Movements *
Airbus A318	1058	1.26	1333
BAe 146	182	1.26	229
RJ85	9587	1.26	12080
RJ1H	7578	1.26	9548
Embraer 135	106	1.26	134
Embraer 170	8933	1.26	11256
Embraer 190	13745	1.26	17319
Dash 8-400	3548	0.63	2235
Fokker 50	13335	0.63	8401
Dornier 328	4361	0.63	2747
Dornier 328 Jet	32	1.26	40
ATR 42	1468	0.63	925
ATR 72	8	0.63	5
Saab 2000	940	0.63	592
General Aviation: Turbo-Fan Aircraft	5450	1.26	6867
General Aviation: Non-Jet Aircraft	171	0.63	108
TOTAL:	70502		73819

* Computed to the nearest whole number

5.0

CONCLUSIONS

No new aircraft have sought provisional categorisation at London City Airport during the period 1st January 2012 up to and including 31st December 2012.

This report presents movement numbers for aircraft operating at London City Airport during the period 1st January 2012 up to and including 31st December 2012. During this period, the airport was operating within the annual limits on aircraft movements and factored movements contained in the planning conditions that apply to the Airport.

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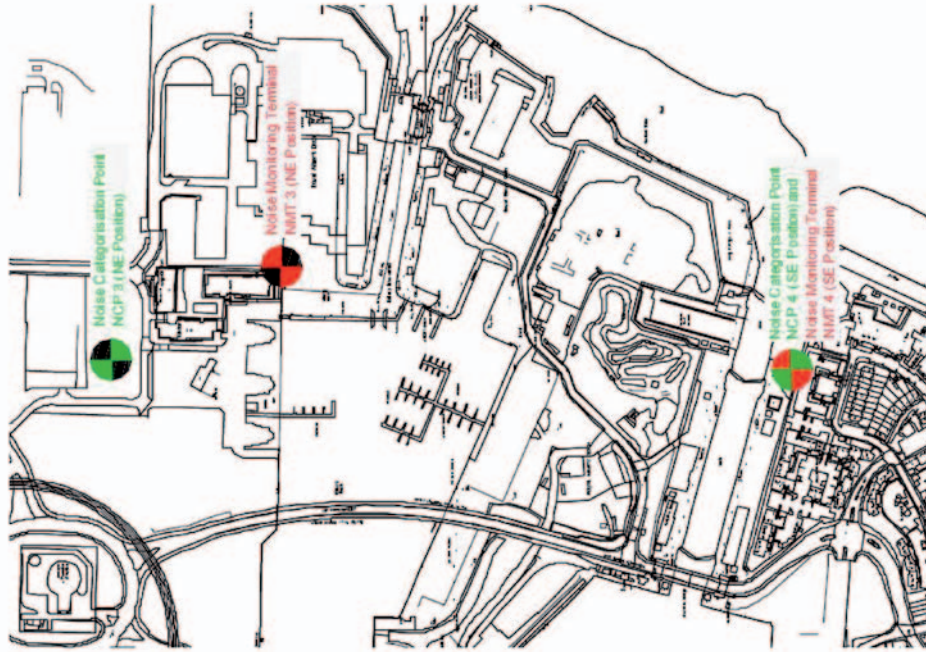


Figure 3 – Noise monitoring locations, east of runway

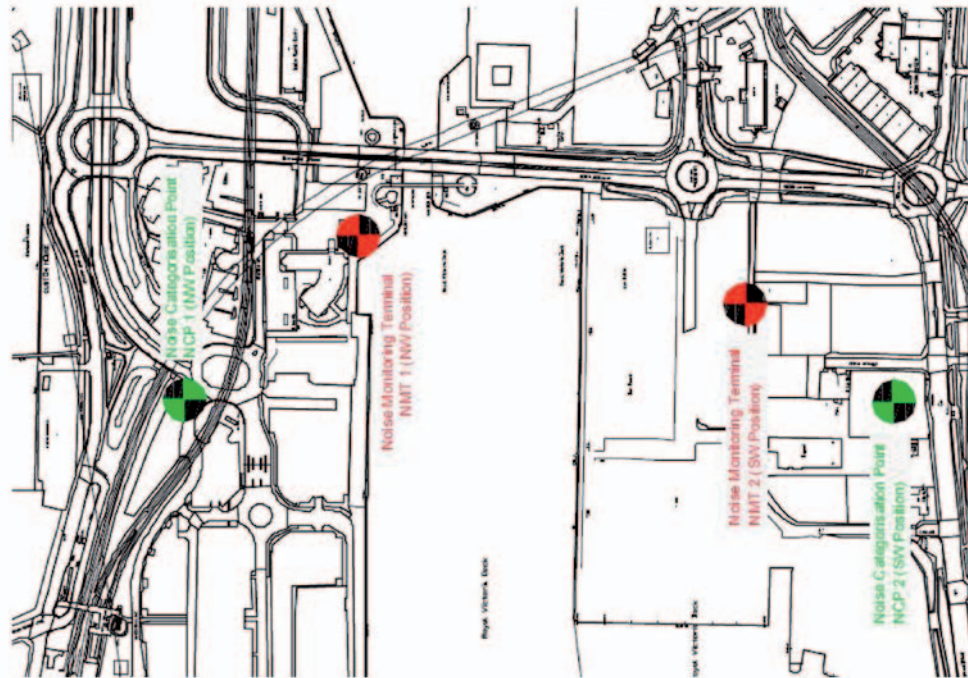


Figure 2 – Noise monitoring locations, west of runway

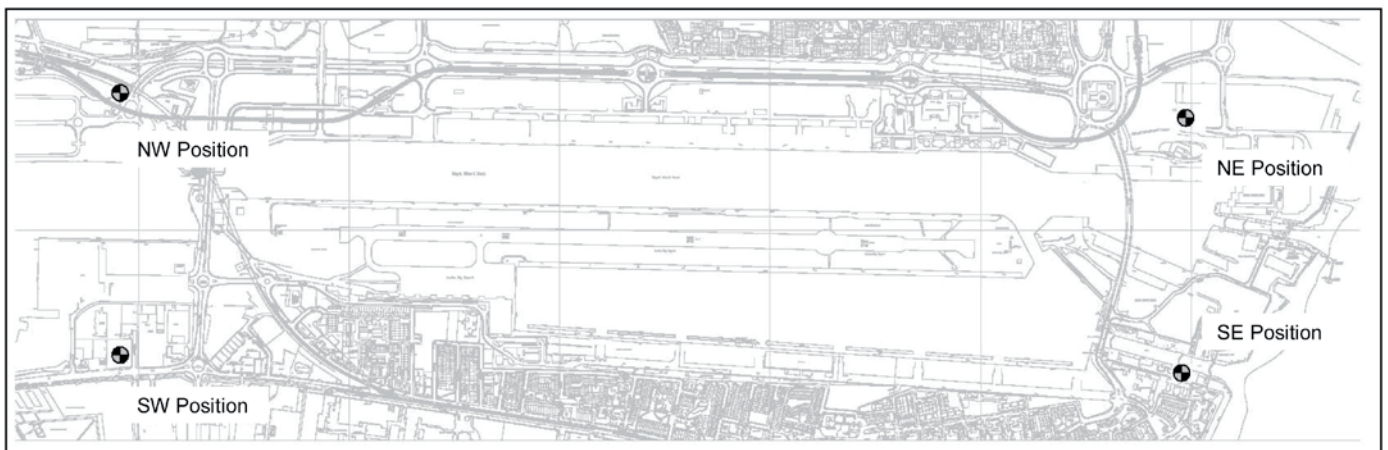


Figure 1 - Noise Categorisation Locations

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APPENDIX A

Mean Annual Departure Noise Levels 2012

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Table A1 – Mean Annual Departure Noise Levels 2012

Aircraft Type	Measured Noise Level (PNdB)	Provisional Noise Category ¹
Airbus A318	93.3	A
ATR 42	90.5	B
ATR 72	--*	B
BAe 146-100	--*	A
BAe 146-200	93.5	A
BAe 146-300	--*	A
Canadair CL60	89.8	A
Cessna Citation C25A	90.3	A
Cessna Citation C25B	89.6	A
Cessna Citation C510	87.4	A
Cessna Citation C525	89.0	A
Cessna Citation C550	88.0	A
Cessna Citation C560	--*	A
Cessna Citation C56X	87.1	A
Cessna Citation C680	89.8	A
Dassault Falcon 10	91.0	A
Dassault Falcon 2000EX	86.5	A
Dassault Falcon 50	90.9	A
Dassault Falcon 900	88.3	A
Dassault Falcon 7X	86.0	A
Dornier 328	88.7	B
Dornier 328 Jet	95.9	B
Dash 8-400	89.3	B
Embraer 135	90.4	A
Embraer 170	93.0	A
Embraer 190	94.2	A
Fokker 50	90.9	B
Gulfstream G150	--*	A
Learjet 40	--*	A
Learjet 45	88.1	A
Piaggio 180	91.1	B
Piper Navajo 31	--*	B
Raytheon Beechcraft 350	84.2	B
Raytheon Beechcraft 200	85.7	B
Raytheon Beechjet 400	88.6	A
Raytheon Beechcraft 58	--*	B
Raytheon Hawker 800XP	88.7	A
RU-85	93.2	A
RU-100	95.2	A
Saab 2000	89.7	B

¹ Previously confirmed Provisional Categorisation unless otherwise stated.

* Insufficient numbers recorded (i.e. less than 10 departures).

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Table A1 above indicates that whilst some aircraft are operating below their provisional categorisation, such as the Embraer 135 and the various Cessna Citation aircraft, two are operating above their category; the RU-100 and Dornier 328 Jet.

LCY are working closely with the operator of the RU-100, Swiss International, to bring the aircraft back within category. The RU-100 has successfully operated within Category A in the past, and a trial conducted by Swiss International in 2012 indicated that a reduction in departure noise, by revising procedural operations, is feasible. A further trial is being conducted during the second quarter of 2013, during which it is anticipated that additional technical insight will be gained into how departure operating procedures can be revised to help reduce departure noise. A timetable for introducing the relevant operating procedures identified as helpful in reducing departure noise will be developed on completion of this further trial, later this year.

The Dornier 328 Jet has operated successfully within Category A in the past, although the aircraft type has not been used frequently at the airport for some years. Very few Dornier 328 Jet aircraft operated at London City Airport during 2012, with a total of only 16 departures taking place during the months of April, July and August. This aircraft has not used the airport since August 2012. The airport has informed the sole operator, Sun Air of Scandinavia, that this aircraft has operated in excess of the airport's noise limits. As a result, Sun Air of Scandinavia have been informed that should they wish to re-introduce the Dornier 328 Jet to London City Airport in the future, they would be required to demonstrate what changes to the departure procedure will be implemented in order to reduce noise to within permitted limits.

The Embraer 190, which operated out of category in 2011, has responded well to revisions to the departure procedure implemented by the manufacturer and operators which included technical modifications to the entire fleet. The mean annual departure noise level for 2012 demonstrates a reduction of 0.4, meaning that this aircraft is now operating within Category A.

Turbo-fan executive aircraft are categorised universally as Category A, and the turbo-prop executive aircraft are categorised universally as Category B. Appendix A indicates that most turbo-fan executive aircraft operated below Category A this year.